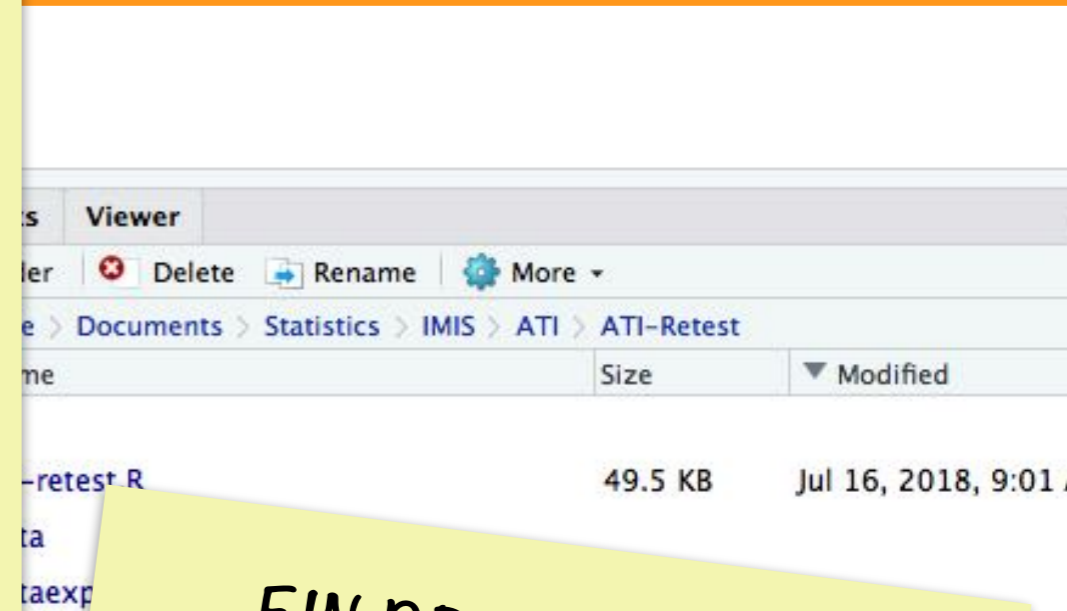


# EINFÜHRUNG IN DIE STATISTIK-SOFTWARE R

BITTE FRAGEBOGEN AUSFÜLLEN:  
[HTTP://BIT.LY/2YUXKAO](http://bit.ly/2YUXKAO)



EIN PRAKTISCHER  
EINSTIEG (HOFFENTLICH)  
OHNE ARRRRRRGHS



# WARUM R?



# WARUM R?



**\$ P \$\$\$**

	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Q9															
1	Temporal Demand	Performance	Effort	Frustration	Aufg. 1 korrekt	Aufg. 2 korrekt	Auffg. 3 korrekt	HTA korrekt	Zeit Aufg. 1	Zeit Aufg. 2	Zeit Aufg. 3	Zeit Alles	Zeit gesamt	UsER zuerst	
2	4	9	7	9	1	0	1	0	00:19:51	00:05:02	00:00:24	00:25:14	00:26:10	Ja	
3	13	4	10	16	1	1	1	1	00:23:52	00:02:10	00:00:36	00:26:38	00:27:32	Nein	
4	7	1	4	4	1	1	1	1	00:17:26	00:00:44	00:00:49	00:18:59	00:19:38	Ja	
5	5	3	3	4	0	N/A	N/A	0	00:13:21	N/A	N/A	N/A	00:13:40	Nein	
6	9	4	10	10	1	1	1	1	00:16:32	00:01:03	00:00:16	00:17:51	00:19:18	Ja	
7	20	11	20	3	0	N/A	N/A	0	00:16:41	N/A	N/A	00:16:41	00:16:41	Nein	
8	4	20	1	20	0	N/A	N/A	0	00:15:20	N/A	N/A	00:16:41	00:16:40	Ja	
9	9	4	3	2	1	1	1	1	00:13:08	00:01:39	00:00:13	00:15:00	00:15:24	Ja	
10	10	13	8	7	1	1	1	1	00:15:37	00:01:07	00:00:10	00:16:54	00:18:16	Ja	
11	11	3	5	10	1	1	1	1	00:14:53	00:00:30	00:00:23	00:15:46	00:16:54	Ja	
12	5	7	3	4	1	1	1	1	00:09:40	00:00:40	00:00:18	00:10:38	00:11:27	Ja	
13	11	1	11	7	1	1	1	1	00:15:16	00:00:59	00:00:26	00:16:42	00:20:54	Ja	
14	12	5	12	6	1	1	1	1	00:13:43	00:00:37	00:00:37	00:14:57	00:15:38	Ja	
15	8	7	6	15	1	1	1	1	00:12:20	00:00:45	00:00:36	00:13	00:13:55	Ja	
16	10	3	7	6	1	1	1	1	00:19:09	00:00:25	00:00:23	00:19:57	00:21:59	Nein	
17	7	8	3	3	0	1	1	0	00:21:41	00:00:56	00:01:37	00:25:12	0:25:31	Nein	
18	6	4	11	2	0	1	1	0	00:13:14	00:03:21	00:00:11	00:16:47	00:18:25	Nein	
19	14	5	6	8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Ja	
20	9,166666667	6,222222222	7,222222222	7,555555556	0,705882353	0,928571429	1	64,71%	00:16:09	00:01:26	00:00:30	00:17:59	00:18:42		
21	Temporal Demand	Performance	Effort	Frustration	Aufg. 1 korrekt	Aufg. 2 korrekt	Auffg. 3 korrekt	HTA korrekt	Zeit Aufg. 1	Zeit Aufg. 2	Zeit Aufg. 3	Zeit Alles	Zeit gesamt	UsER zuerst	
22	10	6	6	7	1	0	1	1	00:30:44	N/A	N/A	N/A	0:32:42	Ja	
23	11	4	6	2	1	1	1	1	00:28:58	00:02:13	00:00:32	00:31:43	0:33:27	Nein	
24	13	13	13	14	1	1	1	1	00:26:05	00:03:47	00:00:11	00:30:18	00:30	Ja	
25	9	14	9	14	0	N/A	N/A	0	00:34:10	N/A	N/A	00:36:30	0:35:42	Nein	
26	16	9	17	17	1	1	1	1	00:29:05	00:02:06	00:01:01	00:32:12	00:32:36	Ja	
27	20	10	13	20	1	0	0	0	00:21:12	00:15:53	00:00:17	0:37:29	0:38:19	Nein	
28	3	3	13	13	1	1	1	1	0:24:05	00:02:11	00:00:15	00:26:31	00:26:43	Ja	
29	14	14	19	18	1	1	1	1	00:18:34	00:02:29	00:00:27	00:21:30	00:22:16	Ja	
30	6	10	9	12	0	0	0	0	00:12:35	00:00:01:58	N/A	00:14:56	00:14:56	Ja	
31	18	14	6	3	1	N/A	N/A	0	00:20:23	N/A	N/A	00:21:04	00:21:04	Ja	
32	8	14	15	15	1	1	1	1	00:13:20	00:04:48	00:00:23	00:18:31	00:19:01	Ja	
33	12	20	11	20	0	N/A	1	0	N/A	N/A	N/A	N/A	00:25:06	Ja	
34	13	10	14	18	1	1	1	1	00:20:22	00:03:08	00:00:23	00:23:53	00:24:17	Ja	
35	16	18	17	20	1	0	1	1	00:18:46	00:00:57	00:00:13	00:19:56	00:20:22	Ja	
36	10	5	16	16	1	0	1	1	00:38:23	00:02:41	00:00:15	00:41:25	00:43:02	Nein	
37	4	13	8	16	1	N/A	N/A	1	00:38:58	N/A	N/A	N/A	00:40:38	Nein	
38	7	8	4	3	0	0	1	0	00:20	00:04:07	00:00:10	00:24:25	00:25:15	Nein	
39	18	3	9	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Ja	
40	11,55555556	10,44444444	11,3888889	13,22222222	0,764705882	0,538461538	0,846153846	64,71%	00:24:44	00:04:02	00:00:22	0:27:10	0:28:35		
41															

H9 fx =AVERAGE(B9:G9)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R		
1	id	mental_dem	physical_dem	temporal_den	x_performance	tlx_effort	utlx_frustration	user	aufg_korr_user	jfg_korr_user	jfg_korr_user	HTA_user_koi	zeit_user_1	zeit_user_2	zeit_user_3	eit_user_1_2	ime_user_tot	UsER	zuerst	mei
2	1	6	2	4	9	7	9	6,16666667	1	0	1	0	1191	302	24	1517	1570	UsER		
3	2	6	6	13	4	10	16	9,16666667	1	1	1	1	1432	130	36	1598	1652	Ppt		
4	3	3	1	7	1	4	4	3,33333333	1	1	1	1	1046	44	49	1139	1178	UsER		
5	4	5	4	5	3	3	4	4	0			0	801				820	Ppt		
6	5	8	3	9	4	10	10	7,33333333	1	1	1	1	992	63	16	1071	1158	UsER		
7	6	6	1	20	11	20	3	10,1666667	0			0	1001				1001	Ppt		
8	7	1	1	4	20	1	20	7,83333333	0			0	920				1000	UsER		
9	8	5	5	9	4	3	4	4,66666667	1	1	1	1	788	99	13	900	924	UsER		
10	9	11	9	10	13	8	8	9,66666667	1	1	1	1	937	67	10	1014	1096	UsER		
11	10	7	1	11	3	5	5		1	1	1	1	893	30	23	946	1014	UsER		
12	11	5	14	5	7	3	3		1	1	1	1	580	40	18	638	687	UsER		
13	12	5	14	11	1	11	11		1	1	1	1	916	59	26	1001	1254	UsER		
14	13	13	6	12	5	12	12		1	1	1	1	823	37	37	897	938	UsER		
15	14	6	2	8	7	6	6		1	1	1	1	740	45	36	821	835	UsER		
16	15	14	10	10	3	7	7		1	1	1	1	1149	25	23	1197	1319	Ppt		
17	16	5	1	7	8	3	3		1	0	1	1	1301	56	97	1454	1531	Ppt		
18	17	5	2	6	4	11	11		1	0	1	1	794	201	11	1006	1105	Ppt		
19	18	10	5	14	5	6	6											UsER		

**Formula Omits Adjacent Cells**

- Update Formula to Include Cells
- Help on this Error
- Ignore Error
- Edit in Formula Bar
- Error Checking Options...

Ready

Stats Data Select.sav [DataSet1] - IBM SPSS Statistics Dateneditor

Datei Bearbeiten Ansicht Daten Transformieren Analysieren Direktmarketing Grafik Extras Fenster Hilfe

Sichtbar: 142 von 142 Variablen

	Alter in Jahren	Geschlecht	VAR00001	Semester Medieninformatik	D1 Tippstil	D2 Körpergröße in cm	Schuhgröße DEEU Systemz. B. 42 oder 37,5	medsplit_groesse	Abiturdurchschnitt	Mathematik auf dem Abitur
1	21	weiblich	0	1	2	178	40	1	2	
2	20	männlich	1	2	2	188	46	1	3	
3	20	männlich	1	2	2	176	42	0	2	
4	20	männlich	1	2	2	186	43	1	2	
5	20	männlich	1	2	2	184	48	1	2	
6	19	männlich	1	2	3	185	44	1	3	
7	22	weiblich	0	2	2	174	39	0	3	
8	19	weiblich	0	2	2	177	42	0	1	
9	26	weiblich	0	4	2	158	38	0	3	
10	20	männlich	1	2	2	181	44	1	3	
11	20	männlich	1	2	1	185	45	1	2	
12	24	weiblich	0	2	2	173	37	0	3	
13	22	männlich	1	4	2	174	43	0	3	
14	20	männlich	1	2	3	183	43	1	2	
15	24	weiblich	0	2	3	173	39	0	3	
16	19	männlich	1	2	2	172	44	0	3	
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										

Stats Data Select.sav [DataSet1] - IBM SPSS Statistics Dateneditor

Datei Bearbeiten Ansicht Daten Transformieren Analysieren Direktmarketing Grafik Extras Fenster Hilfe

	Name	Typ	Spaltenf...	Dezimal...	Beschriftung	Werte	Fehlend	Spalten	Ausrichtung	Maß	Rolle
1	AlterinJahren	Numerisch	11	0	Alter in Jahren:	Keine	Keine	11	Rechts	Skala	Eingabe
2	Geschlecht	Zeichenfolge	9	0	Geschlecht:	Keine	Keine	9	Links	Nominal	Eingabe
3	VAR00001	Numerisch	8	0		Keine	Keine	8	Rechts	Nominal	Eingabe
4	SemesterM...	Numerisch	11	0	Semester (Med...	Keine	Keine	11	Rechts	Nominal	Eingabe
5	D1Tippstil	Numerisch	3	0		{1, 2-Finger-...	Keine	8	Rechts	Nominal	Eingabe
6	D2Körpergr...	Numerisch	11	0	Körpergröße (in...	Keine	Keine	11	Rechts	Skala	Eingabe
7	Schuhgröße...	Numerisch	11	0	Schuhgröße (D...	Keine	Keine	11	Rechts	Skala	Eingabe
8	medsplit_gr...	Numerisch	8	0		Keine	Keine	18	Rechts	Nominal	Eingabe
9	Abiturdurch...	Numerisch	11	0	Abiturdurchsch...	Keine	Keine	11	Rechts	Skala	Eingabe
10	Mathematik...	Numerisch	11	0	Mathematik-No...	Keine	Keine	11	Rechts	Nominal	Eingabe
11	DeutschNot...	Numerisch	11	0	Deutsch-Note a...	Keine	Keine	11	Rechts	Nominal	Eingabe
12	FallsSieinde...	Numerisch	11	0	Falls Sie in der ...	Keine	Keine	11	Rechts	Nominal	Eingabe
13	FallsSievorl...	Zeichenfolge	1952	0	Falls Sie vor Ihr...	Keine	Keine	50	Links	Nominal	Eingabe
14	WelchesBet...	Zeichenfolge	4	0	Welche/s Betri...	Keine	Keine	4	Links	Nominal	Eingabe
15	WelchesBet...	Zeichenfolge	4	0	Welche/s Betri...	Keine	Keine	4	Links	Nominal	Eingabe
16	WelchesBet...	Zeichenfolge	4	0	Welche/s Betri...	Keine	Keine	4	Links	Nominal	Eingabe
17	WelchesBet...	Numerisch	8	2	Welche/s Betri...	Keine	Keine	8	Rechts	Nominal	Eingabe
18	WennSieauf...	Zeichenfolge	4	0	Wenn Sie auf e...	Keine	Keine	10	Links	Nominal	Eingabe
19	WennSieauf...	Zeichenfolge	4	0	Wenn Sie auf e...	Keine	Keine	10	Links	Nominal	Eingabe
20	WennSieauf...	Zeichenfolge	4	0	Wenn Sie auf e...	Keine	Keine	9	Links	Nominal	Eingabe
21	WennSieauf...	Numerisch	8	2	Wenn Sie auf e...	Keine	Keine	8	Rechts	Nominal	Eingabe
22	HabenSiesc...	Zeichenfolge	5	0	Haben Sie sch...	Keine	Keine	5	Links	Nominal	Eingabe
23	FallsSiesch...	Zeichenfolge	729	0	Falls Sie schon...	Keine	Keine	50	Links	Nominal	Eingabe
24	WievieleStu...	Numerisch	11	0	Wie viele Stund...	Keine	Keine	11	Rechts	Nominal	Eingabe
25	BittegebenS...	Zeichenfolge	23	0	Bitte geben Sie...	Keine	Keine	23	Links	Nominal	Eingabe
26	BittegebenS...	Zeichenfolge	23	0	Bitte geben Sie...	Keine	Keine	23	Links	Nominal	Eingabe
27	BittegebenS...	Zeichenfolge	23	0	Bitte geben Sie...	Keine	Keine	23	Links	Nominal	Eingabe
28	Wienützlich...	Zeichenfolge	18	0	Wie nützlich fin...	Keine	Keine	18	Links	Nominal	Eingabe
29	Wienützlich...	Zeichenfolge	18	0	Wie nützlich fin...	Keine	Keine	18	Links	Nominal	Eingabe
30	Wienützlich...	Zeichenfolae	16	0	Wie nützlich fin...	Keine	Keine	16	Links	Nominal	Eingabe

Stats Data Select.sav [DataSet1] - IBM SPSS Statistics Dateneditor

Datei Bearbeiten Ansicht Daten **Transformieren** Analysieren Direktmarketing Grafik Extras Fenster Hilfe

Variable berechnen...  
 Programmierbarkeitstransformation...  
 Werte in Fällen zählen...  
 Werte verschieben...  
 Umcodieren in dieselben Variablen...  
 Umcodieren in andere Variablen...  
 Automatisch umcodieren...  
 Dummy-Variablen erstellen  
 Visuelle Klassierung...  
 Optimale Klassierung...  
 Daten für Modellierung vorbereiten  
 Rangfolge bilden...  
 Assistent für Datum und Uhrzeit...  
 Zeitreihen erstellen...  
 Fehlende Werte ersetzen...  
 Zufallszahlengeneratoren...  
 Anstehende Transformationen ausführen Strg+G

Sichtbar: 142 von 142 Variablen

	Alter in Jahren	Geschlecht	Körpergröße in cm	Schuhgröße DEEU Systemz. B. 42 oder r375	medsplit_groesse	Abiturdurchschnitt	Mathematik auf dem Abitur		
1	21	weiblich		178	40	1	2		
2	20	männlich		188	46	1	3		
3	20	männlich		176	42	0	2		
4	20	männlich		186	43	1	2		
5	20	männlich		184	48	1	2		
6	19	männlich		185	44	1	3		
7	22	weiblich		174	39	0	3		
8	19	weiblich		177	42	0	1		
9	26	weiblich		158	38	0	3		
10	20	männlich		181	44	1	3		
11	20	männlich		185	45	1	2		
12	24	weiblich		173	37	0	3		
13	22	männlich		174	43	0	3		
14	20	männlich		183	43	1	2		
15	24	weiblich	0	2	3	173	39	0	3
16	19	männlich	1	2	2	172	44	0	3
17									
18									
19									
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22									
23									
24									
25									
26									
27									



Stats Data Select.sav [DataSet1] - IBM SPSS Statistics Dateneditor

Datei Bearbeiten Ansicht Daten Transformieren **Analysieren** Direktmarketing Grafik Extras Fenster Hilfe

Berichte  
 Deskriptive Statistiken  
 Tabelle  
 Mittelwerte vergleichen  
 Allgemeines lineares Modell  
 Verallgemeinerte lineare Modelle  
 Gemischte Modelle  
 Korrelation  
 Regression  
 Loglinear  
 Neuronale Netze  
 Klassifizieren  
 Dimensionsreduktion  
 Skala  
 Nicht parametrische Tests  
 Vorhersage  
 Überleben  
 Mehrfachantworten  
 Analyse fehlender Werte...  
 Multiple Imputation  
 Komplexe Stichproben  
 Simulation...  
 Qualitätskontrolle  
 ROC-Kurve...

Sichtbar: 142 von 142 Variablen

	Alter in Jahren	Geschlecht	VAR00001	gröÙeinc	SchuhgröÙe DEEU Systemz.B.42 oder r375	medsplit_groesse	Abiturdurchschnitt	Mathematik auf dem Abiturs
1	21	weiblich		178	40	1	2	
2	20	männlich		188	46	1	3	
3	20	männlich		176	42	0	2	
4	20	männlich		186	43	1	2	
5	20	männlich		184	48	1	2	
6	19	männlich		185	44	1	3	
7	22	weiblich		174	39	0	3	
8	19	weiblich		177	42	0	1	
9	26	weiblich		158	38	0	3	
10	20	männlich		181	44	1	3	
11	20	männlich		185	45	1	2	
12	24	weiblich		173	37	0	3	
13	22	männlich		174	43	0	3	
14	20	männlich		183	43	1	2	
15	24	weiblich		173	39	0	3	
16	19	männlich		172	44	0	3	
17								
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27								



Here is something that I posted to the R-help mailing list a while back, but I think that it gives a good high level overview of the general difference in R and SPSS:

When talking about user friendliness of computer software I like the analogy of cars vs. busses:

Busses are very easy to use, you just need to know which bus to get on, where to get on, and where to get off (and you need to pay your fare). Cars on the other hand require much more work, you need to have some type of map or directions (even if the map is in your head), you need to put gas in every now and then, you need to know the rules of the road (have some type of drivers licence). The big advantage of the car is that it can take you a bunch of places that the bus does not go and it is quicker for some trips that would require transferring between busses.

Using this analogy programs like SPSS are busses, easy to use for the standard things, but very frustrating if you want to do something that is not already preprogrammed.

R is a 4-wheel drive SUV (though environmentally friendly) with a bike on the back, a kayak on top, good walking and running shoes in the passenger seat, and mountain climbing and spelunking gear in the back.

R can take you anywhere you want to go if you take time to learn how to use the equipment, but that is going to take longer than learning where the bus stops are in SPSS.

There are GUIs for R that make it a bit easier to use, but also limit the functionality that can be used that easily. SPSS does have scripting which takes it beyond being a mere bus, but the general philosophy of SPSS steers people towards the GUI rather than the scripts.

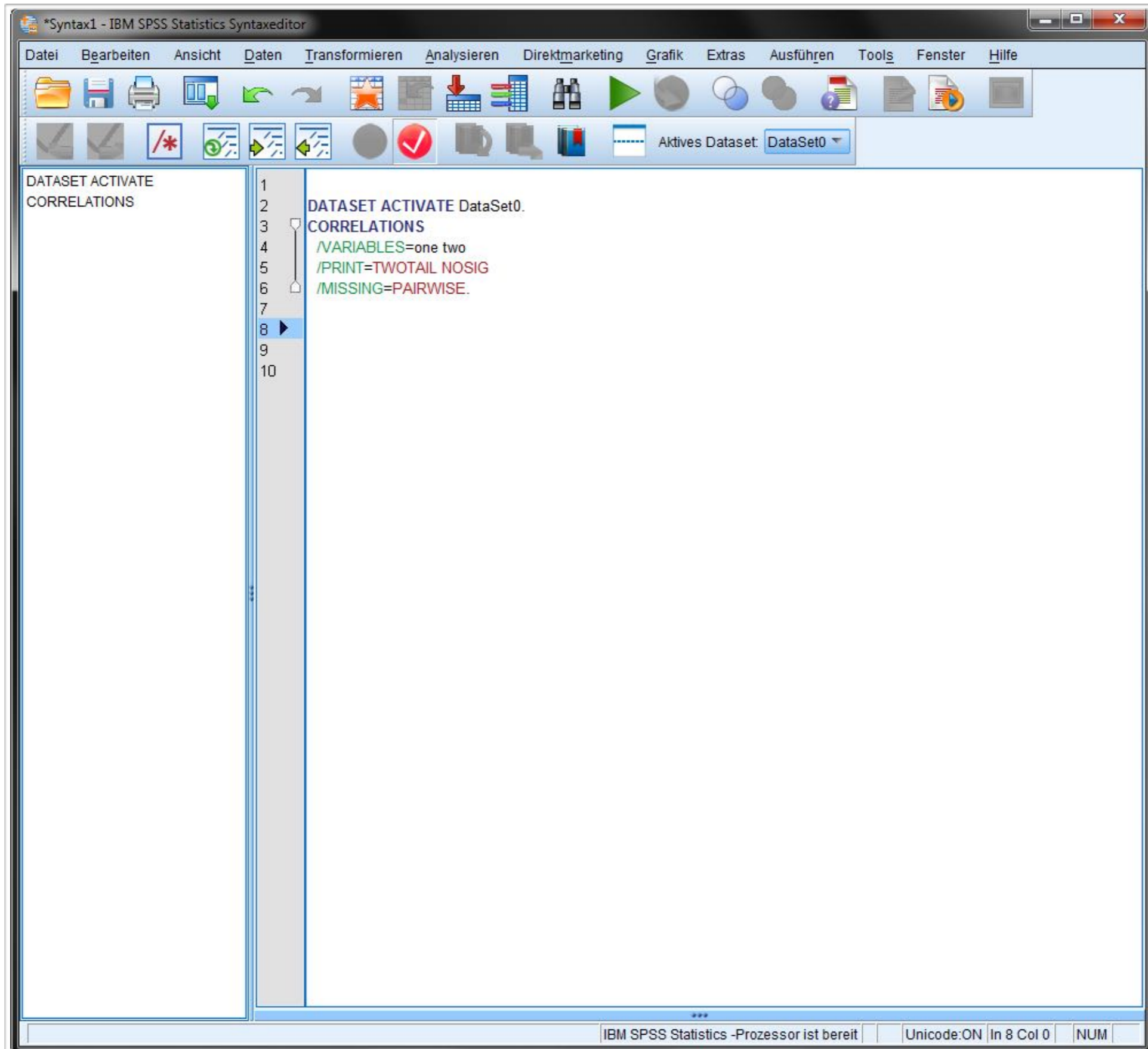
[share](#) [improve this answer](#)

answered Sep 24 '10 at 19:22



[Greg Snow](#)

30.7k ● 2 ● 29 ● 53



# WARUM R?

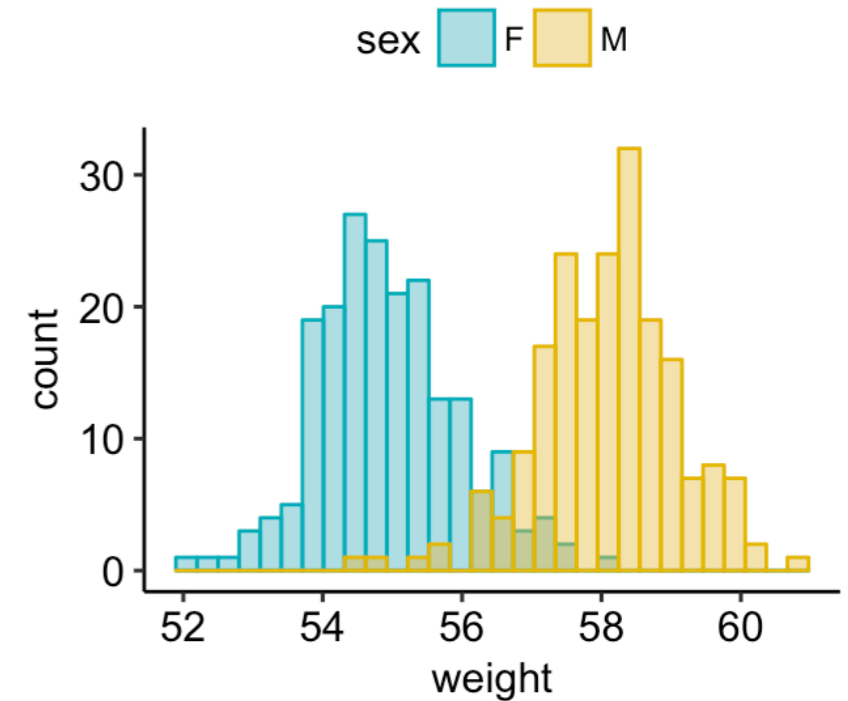
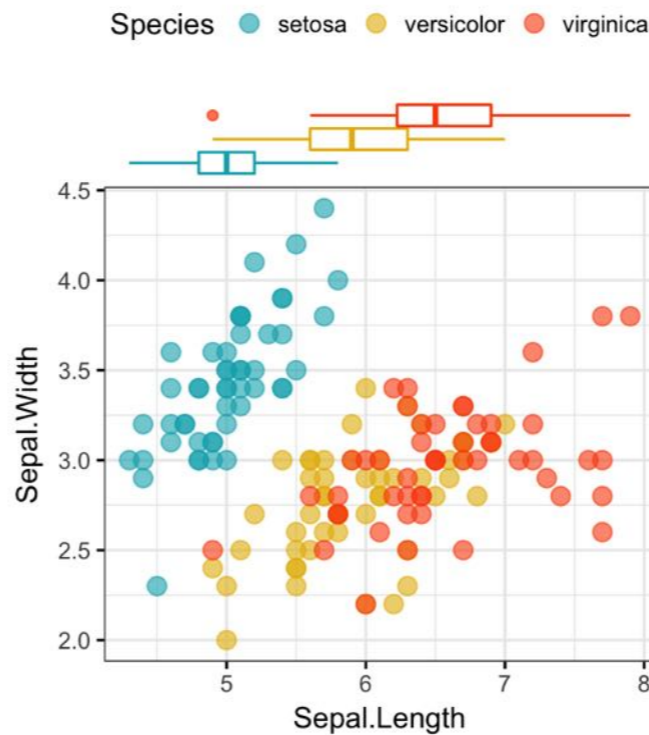
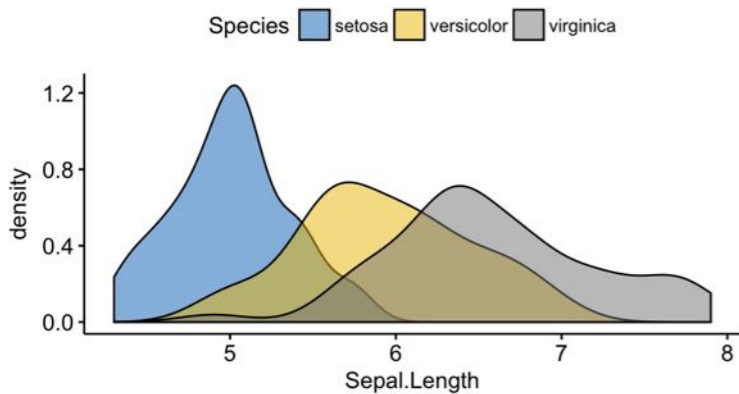
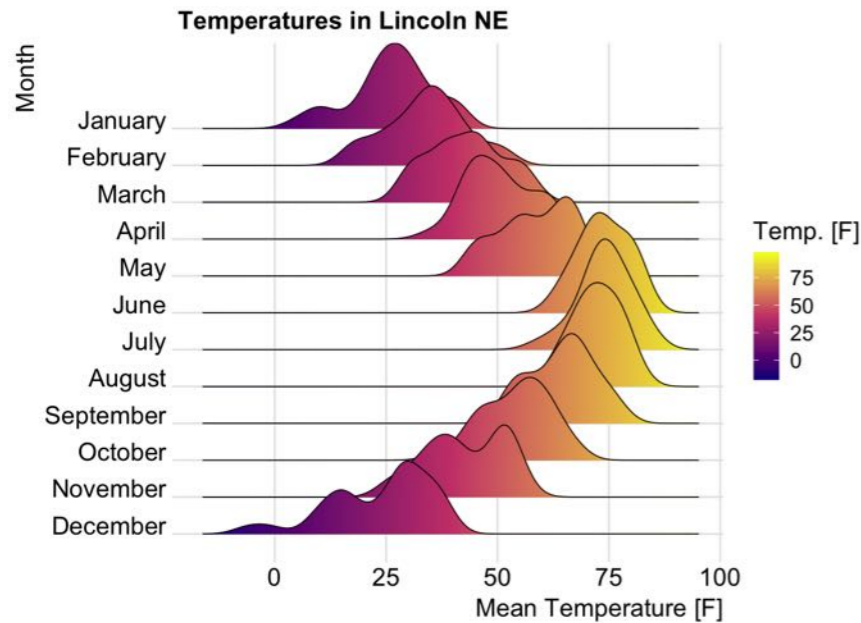
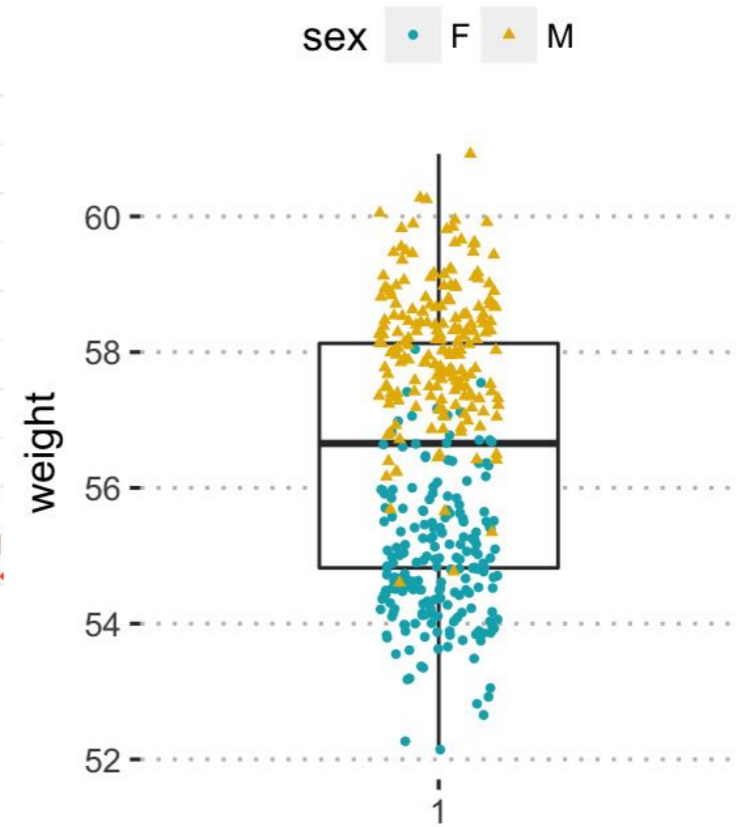
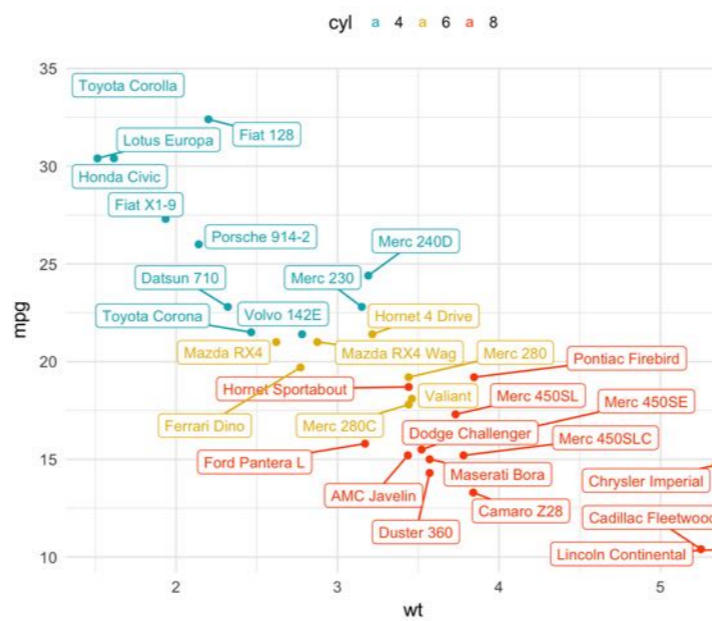
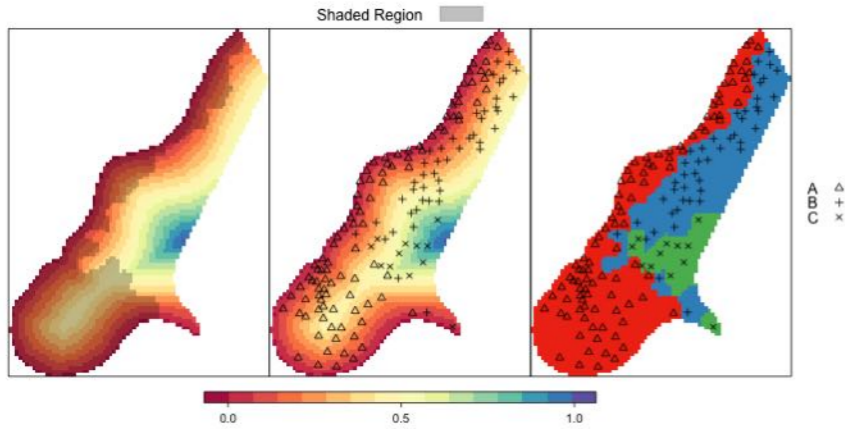


**\$ P \$\$**



- ❖ klare Trennung von Daten und Analysen
- ❖ skriptfokussiert  
(Nachvollziehbarkeit!)  
(Wiederverwendung!)
- ❖ kostenlos
- ❖ <Statistisches Verfahren> ...  
«There's a package for that.»

# R WAOW :-)



Quelle: <http://www.sthda.com/english/articles/32-r-graphics-essentials/133-plot-one-variable-frequency-graph-density-distribution-and-more/>  
[https://casoilresource.lawr.ucdavis.edu/files/9614/1771/9911/spplot\\_examples.png](https://casoilresource.lawr.ucdavis.edu/files/9614/1771/9911/spplot_examples.png)  
<http://www.sthda.com/english/articles/32-r-graphics-essentials/126-combine-multiple-ggplots-in-one-graph/>  
<http://www.sthda.com/english/articles/32-r-graphics-essentials/130-plot-multivariate-continuous-data/>  
<http://www.sthda.com/english/articles/32-r-graphics-essentials/131-plot-two-continuous-variables-scatter-graph-and-alternatives/>

# R (Shiny)

**Data Selection**

**Import Data**

Browse... No file selected

**Select Data**

mtcars

Subset Data

**Data Preprocessing**

**Transpose** No

**Transform** Percentizer

**Annotation** select column

**Row dendrogram**

**Distance method** Euclidean

**Clustering linkage** Complete

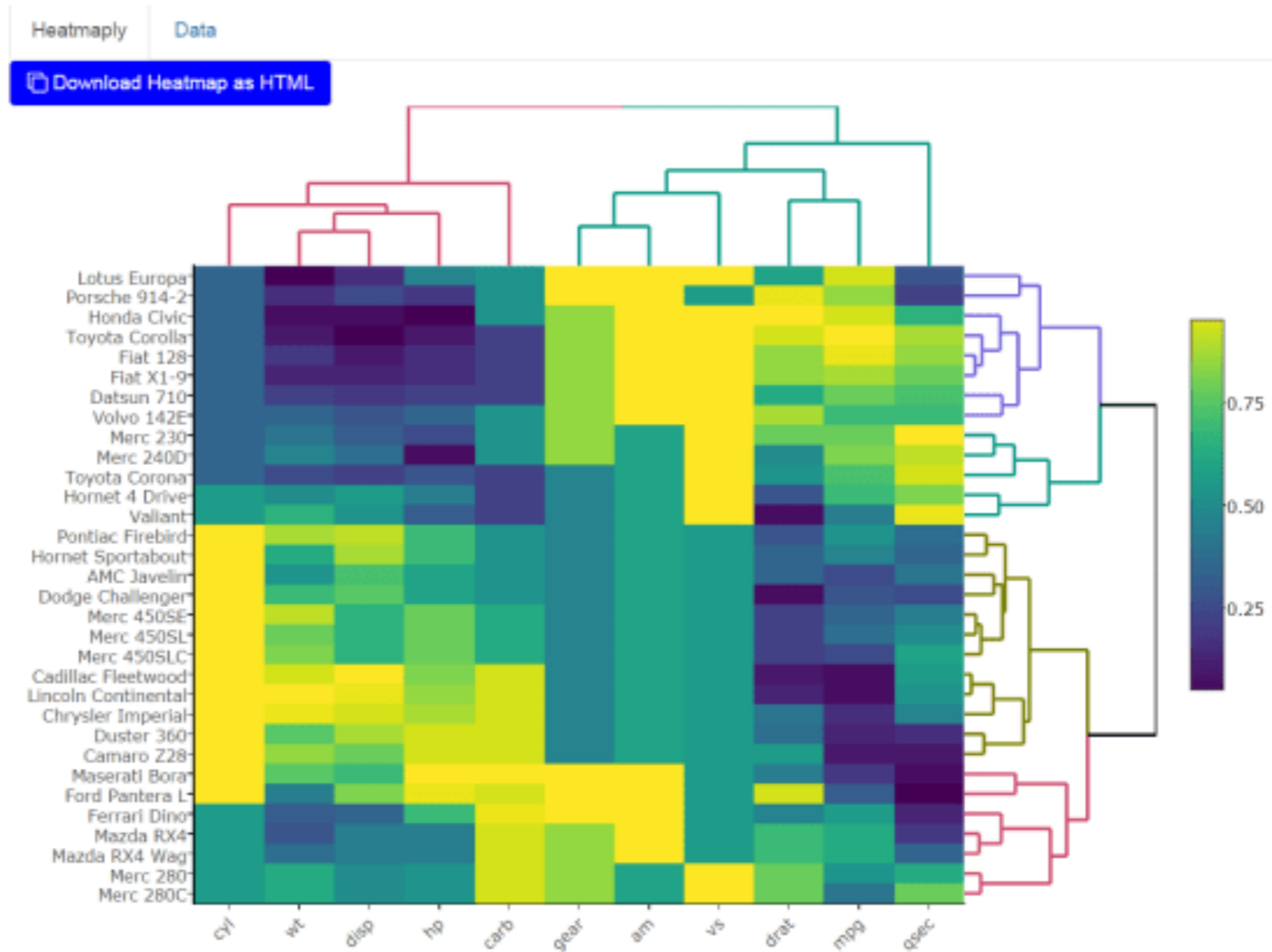
**Number of Clusters**

1 4 15

**Column dendrogram**

**Distance method** Euclidean

**Clustering linkage** Complete





Browser window showing the R Project website. The address bar displays <https://www.r-project.org>. The page title is "R: The R Project for Statistical...".

# The R Project for Statistical Computing

[Home]

## Download

[CRAN](#)

## R Project

- [About R](#)
- [Logo](#)
- [Contributors](#)
- [What's New?](#)
- [Mailing Lists](#)
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## R Foundation

- [Foundation](#)
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## Documentation

- [Manuals](#)
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- [The R Journal](#)
- [Books](#)
- [Certification](#)
- [Other](#)

## Getting Started

R is a free software environment for statistical computing and graphics. It compiles and runs on a wide variety of UNIX platforms, Windows and MacOS. To [download R](#), please choose your preferred [CRAN mirror](#).

If you have questions about R like how to download and install the software, or what the license terms are, please read our [answers to frequently asked questions](#) before you send an email.

## News

- [R version 3.3.1 \(Bug in Your Hair\) prerelease versions](#) will appear starting Saturday 2016-06-11. Final release is scheduled for Tuesday 2016-06-21.
- [R version 3.3.0 \(Supposedly Educational\)](#) has been released on 2016-05-03.
- [R version 3.2.5 \(Very, Very Secure Dishes\)](#) has been released on 2016-04-14. This is a rebadging of the quick-fix release 3.2.4-revised.
- **Notice XQuartz users (Mac OS X)** A security issue has been detected with the Sparkle update mechanism used by XQuartz. Avoid updating over insecure channels.
- The [R Logo](#) is available for download in high-resolution PNG or SVG formats.
- [useR! 2016](#), will take place at Stanford University, CA, USA, June 27 - June 30, 2016.
- [The R Journal Volume 7/2](#) is available.
- [R version 3.2.3 \(Wooden Christmas-Tree\)](#) has been released on 2015-12-10.
- [R version 3.1.3 \(Smooth Sidewalk\)](#) has been released on 2015-03-09.






Browser address bar: <http://ftp5.gwdg.de/pub/misc/cran/>

Browser tabs: The Comprehensive R Archiv...

## The Comprehensive R Archive Network



**CRAN**  
[Mirrors](#)  
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**About R**  
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**Software**  
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[R Binaries](#)  
[Packages](#)  
[Other](#)

**Documentation**  
[Manuals](#)  
[FAQs](#)  
[Contributed](#)

### Download and Install R

Precompiled binary distributions of the base system and contributed packages, **Windows and Mac** users most likely want one of these versions of R:

- [Download R for Linux](#)
- [Download R for \(Mac\) OS X](#)
- [Download R for Windows](#)

R is part of many Linux distributions, you should check with your Linux package management system in addition to the link above.

### Source Code for all Platforms

Windows and Mac users most likely want to download the precompiled binaries listed in the upper box, not the source code. The sources have to be compiled before you can use them. If you do not know what this means, you probably do not want to do it!

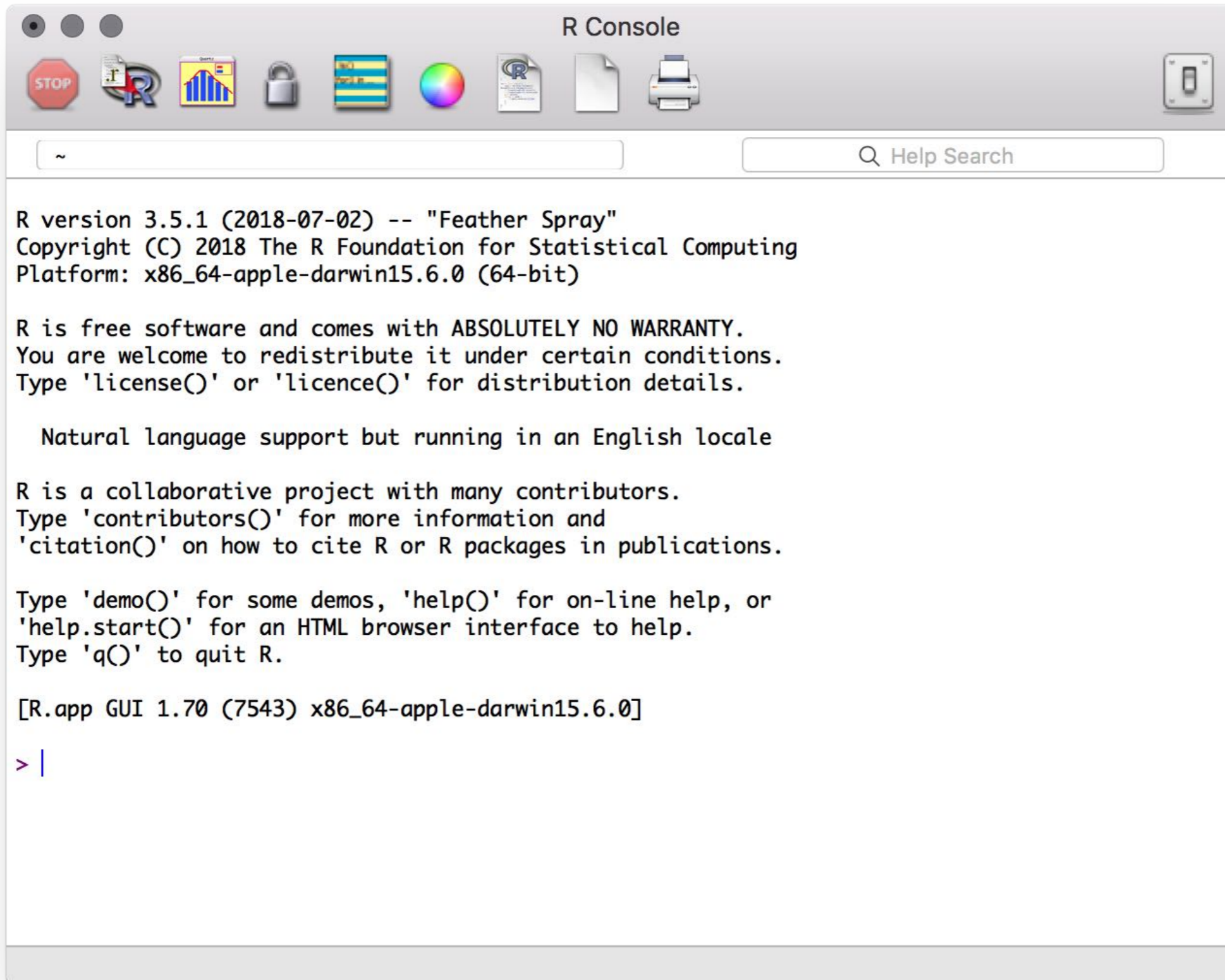
- The latest release (2016-05-03, Supposedly Educational) [R-3.3.0.tar.gz](#), read [what's new](#) in the latest version.
- Sources of [R alpha and beta releases](#) (daily snapshots, created only in time periods before a planned release).
- Daily snapshots of current patched and development versions are [available here](#). Please read about [new features and bug fixes](#) before filing corresponding feature requests or bug reports.
- Source code of older versions of R is [available here](#).
- Contributed extension [packages](#)

### Questions About R

- If you have questions about R like how to download and install the software, or what the license terms are, please read our [answers to frequently asked questions](#) before you send an email.

**What are R and CRAN?**

R is 'GNU S', a freely available language and environment for statistical computing and graphics which provides a wide variety of statistical and graphical techniques: linear and nonlinear modelling, statistical tests, time series analysis, classification, clustering, etc. Please consult the [R project homepage](#) for further information.



The image shows a screenshot of the R Console window on a Mac. The window title is "R Console". The top toolbar contains icons for a stop sign, R logo, a bar chart, a lock, a flag, a color wheel, a document with the R logo, a blank document, a printer, and a mobile device. Below the toolbar is a search bar with the text "Help Search". The main content area displays the following text:

```
R version 3.5.1 (2018-07-02) -- "Feather Spray"  
Copyright (C) 2018 The R Foundation for Statistical Computing  
Platform: x86_64-apple-darwin15.6.0 (64-bit)  
  
R is free software and comes with ABSOLUTELY NO WARRANTY.  
You are welcome to redistribute it under certain conditions.  
Type 'license()' or 'licence()' for distribution details.  
  
Natural language support but running in an English locale  
  
R is a collaborative project with many contributors.  
Type 'contributors()' for more information and  
'citation()' on how to cite R or R packages in publications.  
  
Type 'demo()' for some demos, 'help()' for on-line help, or  
'help.start()' for an HTML browser interface to help.  
Type 'q()' to quit R.  
  
[R.app GUI 1.70 (7543) x86_64-apple-darwin15.6.0]  
> |
```





The screenshot shows a web browser window displaying the RStudio website. The browser's address bar shows 'https://www.rstudio.com'. The website features a navigation menu with 'Products', 'Resources', 'Pricing', 'About Us', and 'Blog'. The main content area has a blue background with the text 'Welcome to RStudio - Open source and enterprise-ready professional software for R'. Below this text are three buttons: 'Download RStudio', 'Discover Shiny', and 'shinyapps.io Login'. To the right is a large blue circle with a white 'R' logo. Below the main content are three feature cards: 'Powerful IDE for R' (with a lightning bolt icon), 'R Packages' (with a gift icon), and 'Bring R to the web' (with a cloud icon). Each card contains a brief description of the feature.

Products Resources Pricing About Us Blog

## Welcome to RStudio - Open source and enterprise-ready professional software for R

[Download RStudio](#) [Discover Shiny](#) [shinyapps.io Login](#)

- Powerful IDE for R**  
RStudio IDE is a powerful and productive user interface for R. It's free and open source, and works great on Windows, Mac, and Linux.
- R Packages**  
Our developers and expert trainers are the authors of several popular R packages, including ggplot2, plyr, lubridate, and others.
- Bring R to the web**  
Shiny is an elegant and powerful web framework for building interactive reports and visualizations using R — with or without web



The screenshot displays the RStudio application window. At the top, the title bar reads "RStudio" and the project is set to "Project: (None)". The main interface is divided into several panes:

- Source Editor:** Located on the left, it shows a file named "Untitled1" with a single line of code: "1". The toolbar includes options for "Source on Save", "Run", and "Source".
- Console:** Located on the right, it shows the output of the R session:

```
Hoi Daniel :-)  
  
Welcome to R at Mon Nov 5 07:48:18 2018  
Loaded packages stats, psych, tidyverse and wesTools.  
> |
```
- Files, Plots, and Viewer:** A horizontal pane at the bottom right, currently empty.
- Environment:** Located at the bottom left, it shows the "Global Environment" and displays the message "Environment is empty".



The screenshot shows the RStudio interface with the following components:

- Script Editor (WISA.R):** Contains R code for data import and processing. The code includes comments, package loading, data reading from an Excel file, and labeling of a variable.
- Console:** Shows the output of the R session, including a greeting and the list of loaded packages: stats, psych, tidyverse, and wesTools.
- Environment:** Currently empty, with the message "Environment is empty".
- Files Panel:** Displays the file explorer for the current project directory, listing various files and folders.

```
1 # R Code for -----
2 # Written by Daniel Wessel
3 # email: danwessel@me.com
4 # please email me directly if you see any errors or have any
  suggestions
5 # created: 2018-11-05 | last update: 2018-xx-xx
6 #
7 # Overview
8 # 1. Import Raw Data
9 # 2. Cleanup and Scales
10 # 3. Basic Calculations
11 # 4. Data Exploration
12 # 5. Figures
13 # 6. Tests
14 # X. Helper Functions
15 # Y. Data Export
16
17 # 1. Import Raw Data -----
18 library(readxl)
19 orgData <- read_excel("IMIS/WISA/data/Wissen.xlsx")
20 workData <- orgData
21 workDataLabel <- "Wie schätzen Sie Ihr derzeitiges Wissen bezüglich
  Literaturrecherchen ein?"
22 names(workData)
23 View(workData)
24
25 # 2. Cleanup and Scales -----
26 workData$Wissen <- ordered(workData$Wissen,
27                             levels=c("gar kein Wissen", "sehr
  wenig Wissen", "wenig Wissen", "mittel", "viel Wissen", "sehr viel
  Wissen", "perfekt"),
28                             labels=c("gar kein\nWissen", "sehr
  wenig\nWissen", "wenig\nWissen", "mittel", "viel\nWissen", "sehr
  viel\nWissen", "perfekt"))
29
```

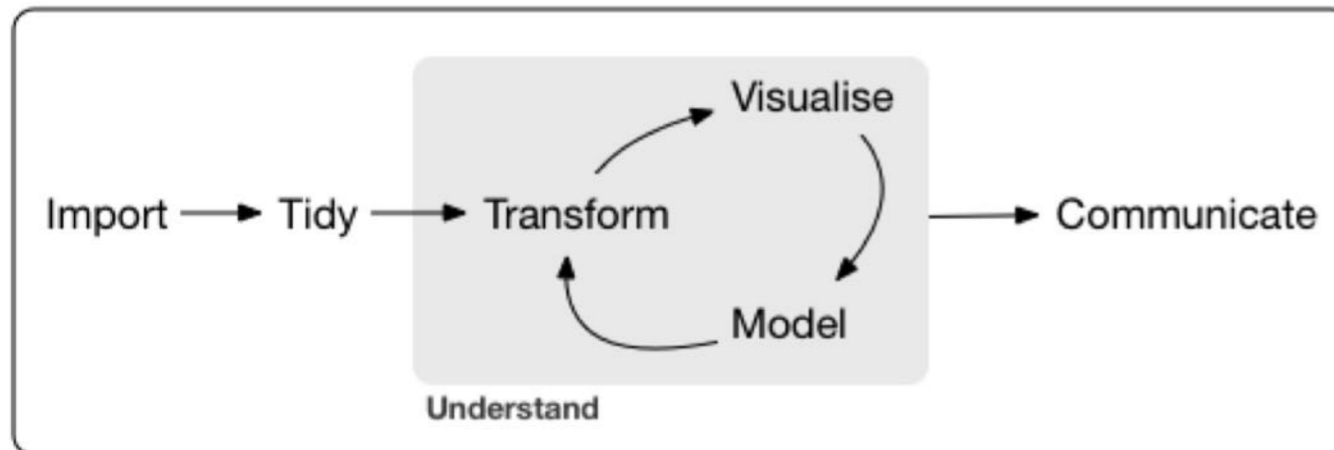
```
Hoi Daniel :-)

Welcome to R at Tue Nov 6 00:30:36 2018
Loaded packages stats, psych, tidyverse and wesTools.
>
```

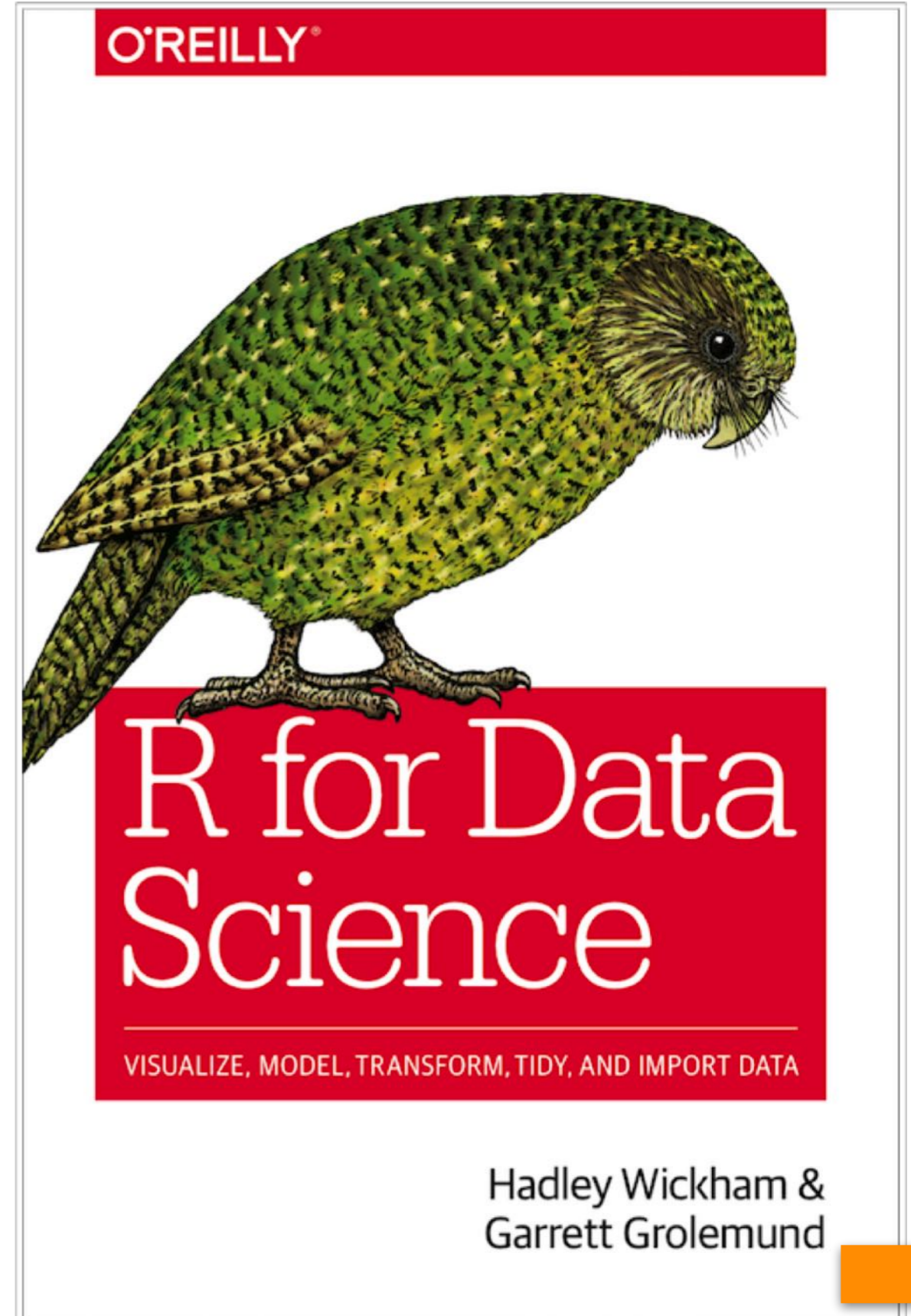
Name	Size	Modified
..		
.Rhistory	23.4 KB	Nov 5, 2018, 1:42 PM
temp_workDataFrame.csv	696 B	Nov 4, 2018, 10:06 AM
.Rprofile	610 B	Oct 19, 2018, 3:08 PM
digitalsquirrel.R	113 B	Oct 8, 2018, 5:09 PM
outfile.txt	19.5 KB	Oct 8, 2018, 5:05 PM
.RData	2.9 KB	Jan 7, 2018, 7:39 PM
autoplotter		
eMDI		
Graphics		
IMIS		
intro-to-r-master		
Learning		
MyPackages		
Other Peoples Files		
Playground		
Private		
Statistik-Kurs		

## Grolemund und Wickham's «R for Data Science»

<http://r4ds.had.co.nz/>



Program



## Burk & Anton's Tadaa- Data: R für Psychos

[https://r-intro.tadaa-  
data.de/book/](https://r-intro.tadaa-data.de/book/)

---

### R FÜR PSYCHOS

*Lukas Burk & Tobias Anton*

*Stand: 04. April 2018 @ 20:09 Uhr*

---

#### VORWORT

---

Das hier wird gerade eine R-Einführung für Psychologiestudierende (und seit 2018 auch für Public HealthInnen) so mit ganz ohne Vorwissen im Bereich Software oder Programmierung. Dieses Werk ist zum Einen die Grundlage für die R-Intro für Psychologiestudierende in QM, und zum Anderen auch das Referenzwerk für das R-Seminar im Rahmen des Statistikmoduls in Public Health.

Die grobe Idee ist es, eine Einstiegspräsentation für die Übung zu haben, und zusätzlich eine long-form Intro als Nachschlagwerk und vertiefendes Material (das hier). Beides sollte ausreichend mit Screenshots/Beispielen ausgefüllt sein um auch die verunsichertesten Neulinge bei der Stange zu halten.

Das Ganze ist so dermaßen work in progress, dass ich sogar das hier eingebaut habe:

```
get_latest_commit(5)
```

[1] "(No recent commits to show)"

#### Über diese Einführung





# STHDA

Statistical tools for high-throughput data analysis

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## What is R and Why Learning R Programming

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## What is R?

<https://www.google.com/search?source=hp&ei=0EjIW4ONLMOorgSj-4iADw&q=r+t-test&oc>

Comics My Blogs StartPage Google GIS Learning Tools Literature R News PDR(p) Textify DT Cut IMIS

r t-test - Google Search

Google  Sign In

All Videos Images News Shopping More Settings Tools

About 4.680.000.000 results (0,70 seconds)

**Quick-R: t-tests**  
<https://www.statmethods.net/stats/ttest.html> ▾  
 Unlike most statistical packages, the default assumes unequal variance and applies the Welsh df modification. ... You can use the `var.equal = TRUE` option to specify equal variances and a pooled variance estimate. ... The chapter "Introduction to t-tests" of this online statistics in R ...

**R: Student's t-Test**  
<https://stat.ethz.ch/R-manual/R-devel/library/stats/html/t.test.html> ▾  
`t.test(x, ...)` ## Default S3 method: `t.test(x, y = NULL, alternative = c("two.sided", "less", "greater"), mu = 0, paired = FALSE, var.equal = FALSE, conf.level = 0.95, .`

**Using t-tests in R | Department of Statistics - UC Berkeley Statistics**  
<https://statistics.berkeley.edu/computing/r-t-tests> ▾  
 Before we can explore the test much further, we need to find an easy way to calculate the t-statistic. The function `t.test` is available in R for performing t-tests.

**How to Perform T-tests in R | DataScience+**  
<https://datascienceplus.com/t-tests/> ▾  
 Aug 17, 2015 - To conduct a one-sample t-test in R, we use the syntax `t.test(y, mu = 0)` where x is the name of our variable of interest and mu is set equal.

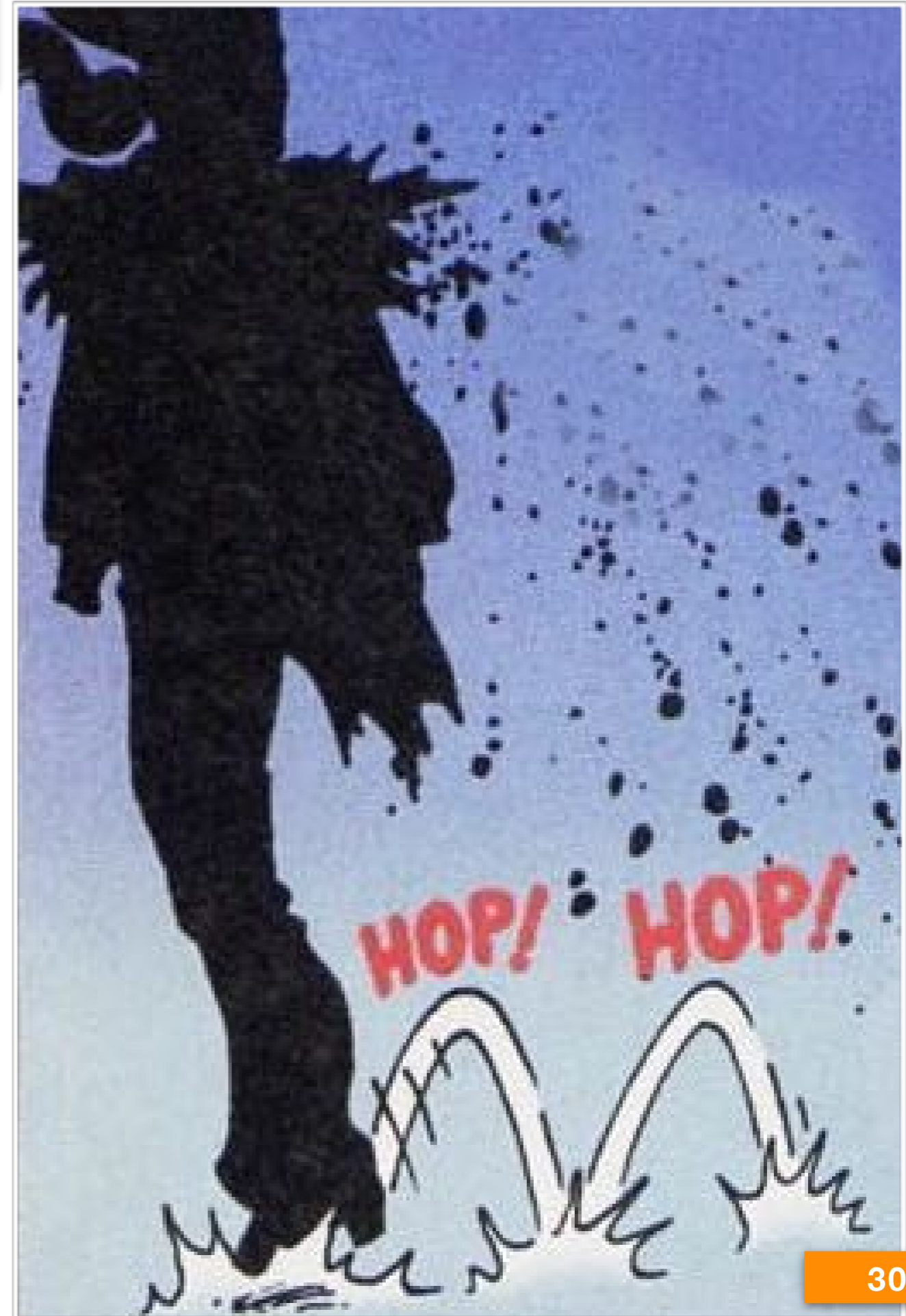
**Unpaired Two-Samples T-test in R - Easy Guides - Wiki - STHDA**  
[www.sthda.com](http://www.sthda.com) > ... > R software > R Basic Statistics > Comparing Means in R ▾

- **RStudio's ggplot2-cheatsheet:** <https://www.rstudio.com/wp-content/uploads/2015/03/ggplot2-cheatsheet.pdf>
- **Field, Miles, & Field (2012)'s «Discovering Statistics Using R»**
- **datacolada's Blog Entry 69:** <http://datacolada.org/69>

**Das war's.**

**Das wär's.**

- Garbage In, Garbage Out.
- Immer und immer und immer wieder überprüfen was man eigentlich gerade wirklich macht.
- Plausibilität?
- versteckte Annahmen (Daten, stat. Verfahren)
- findet Rationalisierungen für Ergebnisse, aber fällt anderen auf!



# PACKAGES

The screenshot shows the RStudio interface with the following components:

- Source Editor:** Contains an R script with 35 lines of `install.packages()` calls for various packages, including `psych`, `tidyverse`, `combinat`, `lawstat`, `ez`, `binom`, `pwr`, `XML`, `xml2`, `nortest`, `car`, `afex`, `animation`, `modelr`, `ggjoy`, `scales`, `gmodels`, `gapminder`, `paran`, `lavaan`, `devtools`, `devtools::install_github("dgrtwo/gganimate")`, `RCurl`, `httr`, `magick`, `install_github("tadaadata/tadaatoolbox")`, `apaTables`, `sjPlot`, `sjmisc`, `sjstats`, `sjlabelled`, `tinytex`, `viridis`, `hexbin`, and `Hmisc`.
- Console:** Shows the output of the script execution:

```
Hoi Daniel :-)  
Welcome to R at Tue Nov 6 00:30:36 2018  
Loaded packages stats, psych, tidyverse and wesTools.  
> |
```
- Files Panel:** Shows the file explorer for the current project, displaying a list of files and folders:

Name	Size	Modified
..		
install_packages.R	2.5 KB	Oct 17, 2018, 4:30 PM
createPackages.R	900 B	May 12, 2018, 6:56 PM
wesTools		
- Environment Panel:** Shows the current environment, which is empty.

# PACKAGES

Installieren von Packages

```
install.packages("tidyverse")
```

Updating Packages

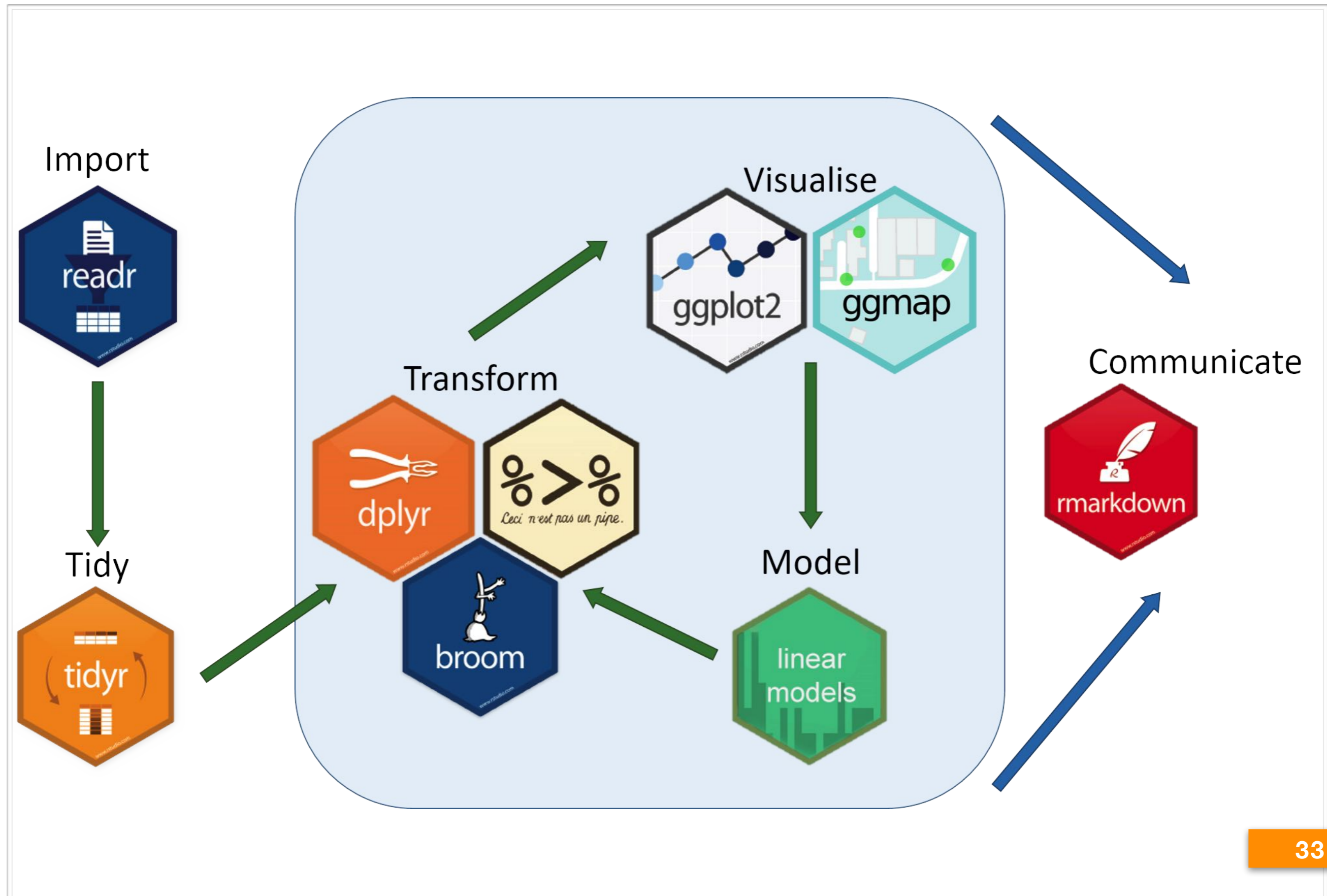
```
update.packages(ask=FALSE)
```

Verfügbar machen von Packages

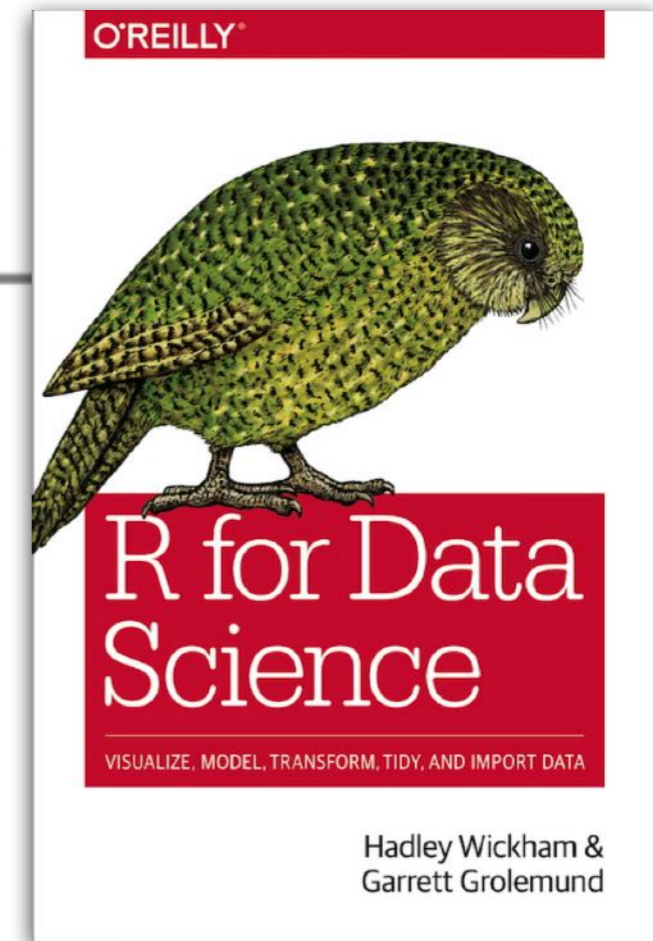
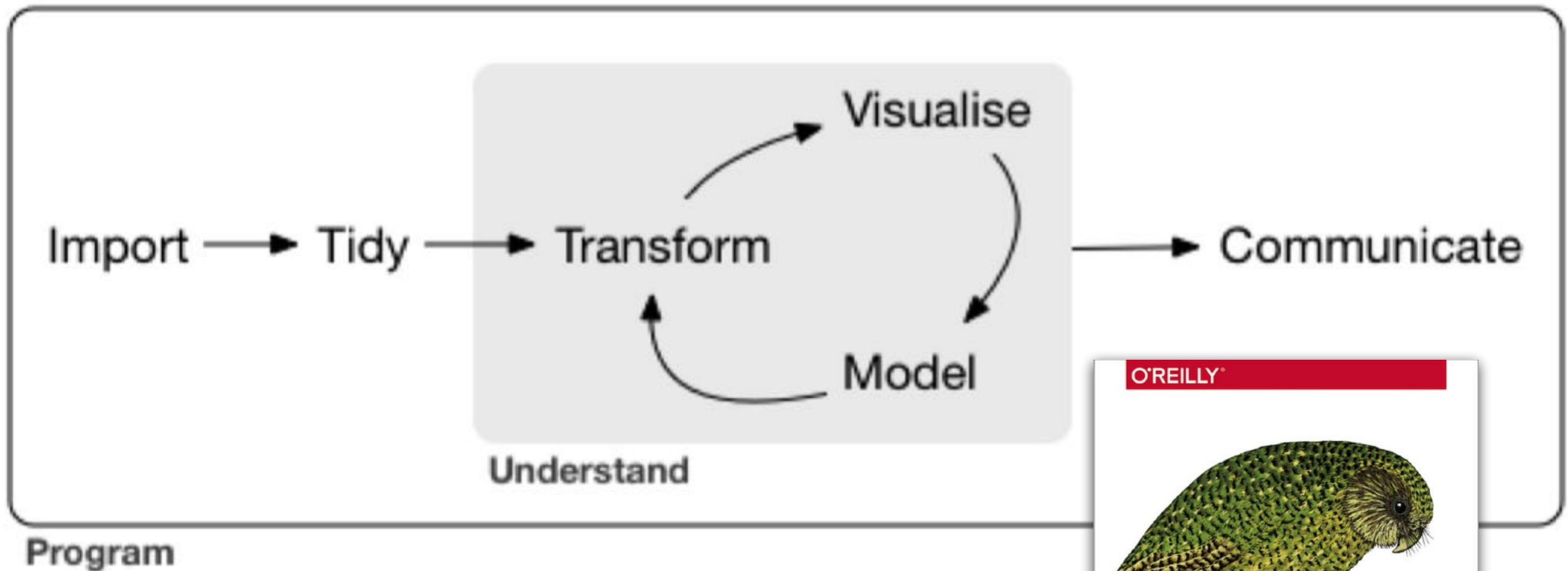
```
library(tidyverse)
```








# TIDYVERSE PACKAGE



# PROZESSMODELL AUSWERTUNG



# VERZEICHNISSTRUKTUR

- ▼  ATI-Retest
  - ▶  plots
  -  ati-retest.R
  - ▶  dataexport
  - ▶  data









# VERZEICHNISSTRUKTUR

▼	📁	ATI-Retest	Projekt
▶	📁	plots	
	📄	ati-retest.R	
▶	📁	dataexport	
▶	📁	data	






# VERZEICHNISSTRUKTUR

▼	📁	ATI-Retest	Projekt
	▶	📁	plots
R Script (+Datum?)	📄	ati-retest.R	
	▶	📁	dataexport
	▶	📁	data







# VERZEICHNISSTRUKTUR

	  <b>ATI-Retest</b>	<b>Projekt</b>
	  <b>plots</b>	
<b>R Script (+Datum?)</b>	 <b>ati-retest.R</b>	
	  <b>dataexport</b>	
<b>Originaldaten *(nur lesen!)</b>	 <b>data</b>	

# VERZEICHNISSTRUKTUR

	 <b>ATI-Retest</b>	<b>Projekt</b>
	 <b>plots</b>	
<b>R Script (+Datum?)</b>	 <b>ati-retest.R</b>	
<b>Veränderte Datendateien</b>	 <b>dataexport</b>	
<b>Originaldaten *(nur lesen!)</b>	 <b>data</b>	

# VERZEICHNISSTRUKTUR


	  <b>ATI-Retest</b>	<b>Projekt</b>
<b>Abbildungen speichern</b>	 <b>plots</b>	
<b>R Script (+Datum?)</b>	 <b>ati-retest.R</b>	
<b>Veränderte Datendateien</b>	 <b>dataexport</b>	
<b>Originaldaten *(nur lesen!)</b>	 <b>data</b>	




# VERZEICHNISSTRUKTUR

▼  **ATI-Retest** **Projekt**


Abbildungen  
speichern

 **plots**


R Script  
(+Datum?)

 **ati-ret**



Veränderte  
Datendateien

 **dataex**


Originaldaten  
\*(nur lesen!)


 **data**

R Project: (None) ▼

-  New Project...
-  Open Project...
- Open Project in New Session...
- Close Project

---


weTools 

eMDI 

---

Clear Project List

---

Project Options... 



# AUFBAU SCRIPT

The screenshot displays the RStudio environment with the following components:

- Source Editor:** Contains R code for a script titled "Untitled1". The code includes a header with author information (Daniel Wessel), a table of contents, and the start of the "1. Import Raw Data" section. The code defines variables for reading and renaming data.
- Console:** Shows the output of the script execution, including a greeting "Hoi Daniel :-)", a welcome message for R, and a list of loaded packages: stats, psych, tidyverse, and wesTools.
- Environment Pane:** Shows the "Global Environment" which is currently empty.

```
1 # R Code for _____
2 # Written by Daniel Wessel
3 # email: danwessel@me.com
4 # please email me directly if you see any errors
  or have any suggestions
5 # created: 2018-11-05 | last update: 2018-xx-xx
6 #
7 # Overview
8 # 1. Import Raw Data
9 # 2. Cleanup and Scales
10 # 3. Basic Calculations
11 # 4. Data Exploration
12 # 5. Figures
13 # 6. Tests
14 # X. Helper Functions
15 # Y. Data Export
16
17 # 1. Import Raw Data -----
18 orgData <- read_delim("", delim=";")
19 workData <- orgData
20 workDataLabel <- "_____"
21 names(workData)
22 View(workData)
23 |
24 # 2. Cleanup and Scales -----
25 # workData <- rename(workData,
26 #                       `__NEW__` = `__ORG__`)
27
```

```
Hoi Daniel :-)

Welcome to R at Mon Nov  5 08:06:52 2018
Loaded packages stats, psych, tidyverse and wesTools.
> |
```

Environment is empty



# AUFBAU SCRIPT

The screenshot shows the RStudio interface with an R script file named 'Untitled1\*' open. The script contains a header section (lines 1-16) and a section for '1. Import Raw Data' (lines 17-23). The header section is highlighted with an orange box and contains the following text:

```
1 # R Code for _____  
2 # Written by Daniel Wessel  
3 # email: danwessel@me.com  
4 # please email me directly if you see any errors  
5 # or have any suggestions  
6 # created: 2018-11-05 | last update: 2018-xx-xx  
7 #  
8 # Overview  
9 # 1. Import Raw Data  
10 # 2. Cleanup and Scales  
11 # 3. Basic Calculations  
12 # 4. Data Exploration  
13 # 5. Figures  
14 # 6. Tests  
15 # X. Helper Functions  
16 # Y. Data Export
```

The console window shows the output of the script execution, including the time '08:06:52 2018' and the message 'Loaded packages stats, psych, tidyverse and wesTools.' The environment window at the bottom shows 'Global Environment' and 'Environment is empty'.

## Hintergrund Informationen



# AUFBAU SCRIPT

The screenshot shows the RStudio interface with an R script file named 'Untitled1\*' open. The script contains a table of contents and the beginning of a data import function. The console shows the output of running the script.

```
1 # R Code for _____  
2 # Written by Daniel Wessel  
3 # email: danwessel@me.com  
4 # please email me directly if you see any errors  
  or have any suggestions  
5 # created: 2018-11-05 | last update: 2018-xx-xx  
6 #  
7 # Overview  
8 # 1. Import Raw Data  
9 # 2. Cleanup and Scales  
10 # 3. Basic Calculations  
11 # 4. Data Exploration  
12 # 5. Figures  
13 # 6. Tests  
14 # X. Helper Functions  
15 # Y. Data Export  
16 #  
17 # 1. Import Raw Data -----  
18 orgData <- read_delim("", delim=";")  
19 workData <- orgData  
20 workDataLabel <- "_____"  
21 names(workData)  
22 View(workData)  
23 |  
24 # 2. Cleanup and Scales -----  
25 # workData <- rename(workData,  
26 #                       `__NEW__` = `__ORG__`)  
27
```

The console output shows:

```
Hoi Daniel :-)  
Welcome to R at Mon Nov 5 08:06:52 2018  
... ch, tidyverse and wesTools.
```

The Environment pane at the bottom shows 'Global Environment' and 'Environment is empty'.

## Inhalts- verzeichnis



# AUFBAU SCRIPT

The screenshot shows the RStudio interface with a script editor on the left and a console on the right. The script contains a table of contents and the start of the first section. An orange box labeled "Outline" points to the table of contents in the script. The console shows the output of the R script.

```
# R Code for _____  
# Written by Daniel Wessel  
# email: danwessel@me.com  
# please email me directly if you see any errors  
# or have any suggestions  
# created: 2018-11-05 | last update: 2018-xx-xx  
#  
# Overview  
# 1. Import Raw Data  
# 2. Cleanup and Scales  
# 3. Basic Calculations  
# 4. Data Exploration  
# 5. Figures  
# 6. Tests  
# X. Helper Functions  
# Y. Data Export  
eof  
  
# 1. Import Raw Data -----  
orgData <- read_delim("_____", delim=";")  
workData <- orgData  
workDataLabel <- "_____"  
names(workData)  
View(workData)  
|  
# 2. Cleanup and Scales -----  
# workData <- rename(workData,  
# _____ NEW ` = ` ____ ORG ` )  
|  
# 1. Import Raw Data
```

Console output:

```
Hoi Daniel :-)  
Welcome to R at Mon Nov 5 08:06:52 2018  
Loaded packages stats, psych, tidyverse and wesTools.  
>
```



- Lime
- Survey —  
Fragebogen  
Codes
- Coding for  
Retests
- ...



- RMarkdown
- Copy-Paste
- Graphexport  
mit Themes
- ...

«Code too soon and debug forever.»

*Programmer Proverb*

# GRUNDLEGENDE SYNTAX

```
# Kommentar
```

```
x <- y      # Zuweisung
```

```
orgData <- read_excel("IMIS/WISA/data/  
Wissen.xlsx")
```

```
workDataLabel <- "Wie schätzen Sie Ihr  
derzeitiges Wissen bezüglich  
Literaturrecherchen ein?"
```

# GRUNDLEGENDE SYNTAX

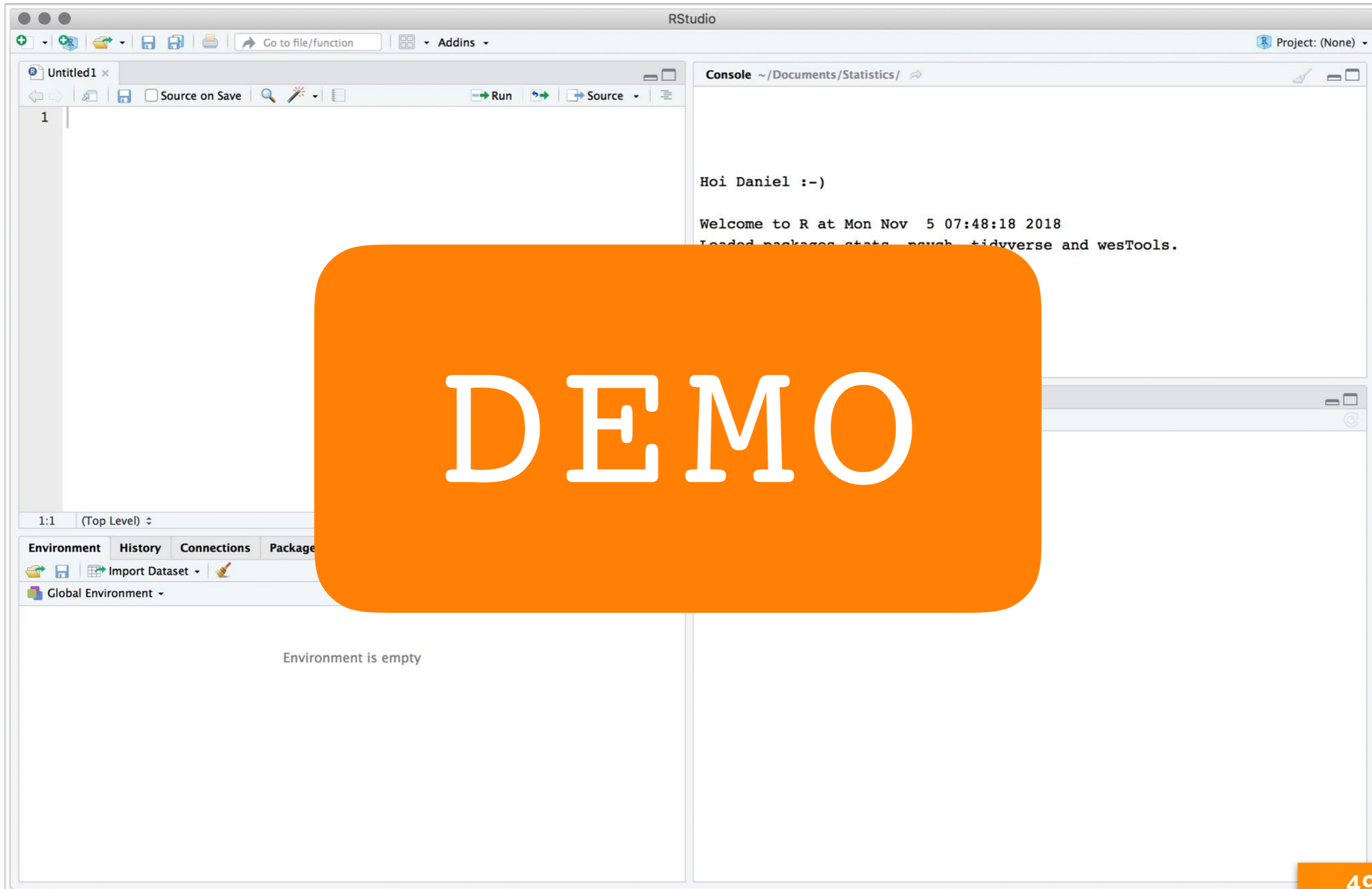
```
# Funktion ausführen
```

```
names(workData)
```

```
mean(workData$age)
```

```
mean(age_with_missing, na.rm=TRUE)
```





**Vielen herzlichen Dank  
und viel Erfolg beim Auswerten. :-)**

**Feedback gerne an:  
danwessel@me.com**

**organizingcreativity.com**

**Folien, R Script + Daten unter:**

**<http://bit.ly/2PkbkcE>**





